

A Systematic Review on Teachers Self Regulation using Vos viewer

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Abstract -Competences in self-regulated learning (SRL) are important prerequisites for success in school and beyond. Teachers play a crucial role in students' development of SRL. The objective of this study is to conduct a literature review to understand the concept of teachers as self-regulated learners using AI driven Technology. The study analysed related studies that had been done in the past using the Vosviewer programme for the years 1980 to 2024 in order to understand the year-by-year publications, research articles, and book chapters in the subject of Teacher as self regulated learner. This has given researchers a thorough understanding of previous research in the field. In conclusion, the synthesis of the reviewed studies underscores the paramount importance of self-regulated learning (SRL) and metacognitive awareness (MA) in both student learning and teacher education. The findings collectively emphasise the critical need for teachers to possess a deep understanding of these concepts and to effectively integrate them into their teaching practices.

Keywords: *self-regulated learning, Teachers, metacognitive awareness, Vosviewer programme*

INTRODUCTION

The importance of competencies in self-regulated learning (SRL) for academic achievement, flourishing in life and lifelong learning has been highlighted. When considering teachers' professional competencies in self-regulated learning (SRL), two key areas are important: teachers' own SRL competencies and experiences (i.e., teachers as self-regulated learners) and their ability to diagnose, model, and support SRL in the classroom (i.e., teachers as self-regulated learners). teachers as facilitators of SRL). The aim of our paper is to conceptualise teachers' professional competences in Self Regulating Learning that integrate these two areas of competence: teachers as

students; Teachers' previous experiences play a pivotal role in shaping their instructional practices and their ability to support students' self-regulated learning (SRL). These experiences, encompassing their own educational trajectories and personal encounters with SRL, serve as a foundation for their future professional competencies as SRL facilitators and significantly influence how they teach SRL in their classrooms.

Teachers who have actively engaged in SRL throughout their careers are more adept at fostering a similar mindset in their students. They can draw on their own learning journeys to better understand and address the various stages of SRL development in their students. This understanding allows them to recognize the specific needs, obstacles, and difficulties that students may encounter as they strive to become more self-regulated learners. For instance, teachers with rich SRL backgrounds are more attuned to identifying when a student is struggling with setting goals, monitoring their progress, or reflecting on their learning strategies.

Moreover, these teachers can more effectively perceive the practical challenges associated with implementing SRL strategies in the classroom. Their firsthand experience with SRL equips them with the insight needed to make necessary adjustments to their instructional methods, ensuring that their teaching practices are both effective and supportive of student SRL. For example, a teacher who understands the importance of goal setting in SRL might implement regular check-ins with students to discuss and refine their goals, thus helping students stay on track and motivated.

Conversely, teachers who lack a well-developed understanding of how to self-regulate their learning are less equipped to guide their students in becoming successful self-regulated learners. Without this critical

skill set, these teachers may struggle to provide the appropriate support and guidance that students need to develop strong SRL capabilities. This gap can result in students missing out on crucial aspects of SRL, such as effective time management, strategic planning, and reflective practices.

The extent of a teacher's SRL experiences also influences their ability to convey a mastery goal orientation within their classroom. Teachers with robust SRL backgrounds are more likely to emphasise the importance of learning and mastery over performance, fostering a classroom environment that values growth and continuous improvement. This orientation not only enhances students' SRL but also shapes their beliefs about the power of SRL in achieving academic success.

There is substantial evidence that teachers are more inclined to promote and implement strategies that they have mastered and found effective in their own learning. When teachers have personally experienced the benefits of SRL, they are more confident in teaching these strategies to their students. This confidence translates into more effective and enthusiastic instruction, which in turn, positively impacts student learning outcomes.

Therefore, it is reasonable to conclude that teachers' actions and decisions in the classroom are heavily influenced by their competencies as self-regulated learners. Despite the recognized importance of teacher SRL, there remains a scarcity of studies explicitly focusing on teachers as self-regulated learners. This gap in the research underscores the need for further investigation into how teachers develop and apply SRL in their professional lives, and how this, in turn, affects their instructional practices and student outcomes.

Fostering Self-Regulated Learning: Insights for Educators

Successful self-regulated learners demonstrate a strong grasp of metacognitive knowledge, a key aspect of self-regulated learning (SRL). This type of knowledge involves being aware of and managing one's own learning processes. It includes the ability to select effective strategies and is often associated with higher achievement. Metacognitive knowledge covers both conscious and unconscious understanding of memory, comprehension, and learning processes. It entails knowing when, why, and how to apply specific

strategies in various learning scenarios, as well as recognizing one's strengths and weaknesses in information processing.

For teachers, having robust metacognitive knowledge is essential. Their awareness and understanding of different strategies and metacognitive processes are fundamental for developing their own metacognitive skills and for fostering SRL in their students. Teachers need to thoroughly understand metacognition to create opportunities for students to develop these skills in the classroom. Despite its importance, research shows that many pre-service teachers lack sufficient and cohesive knowledge about metacognition and SRL. This underscores the need for teacher training programs that effectively support the development of metacognitive knowledge.

Comprehensive teacher training should connect existing metacognitive knowledge with new insights into SRL and teaching strategies. By addressing misconceptions and fostering a well-structured understanding of SRL strategies, teacher training can better equip educators to support their students' development of metacognitive skills and self-regulated learning practices.

Research Gap: There are very limited studies on the self regulation of the teachers and does not exist any review study which talks about systematic literature review on self regulation of teachers. Although there has been extensive research studies conducted on the self regulated learning, self regulation of students and its impact on their learning. A very few studies have made a mention of teachers' self regulation and/or other factors related to this. Therefore there is a need to address this research gap and compile all the relevant research work done on self regulation of teachers and to identify the noticeable areas where research is going on. The study addresses these research questions or objectives:

RQ1. What is the present status of research in Self Regulation of Teachers?

RQ2. Identify the research done on teachers self-regulated learning (SRL) and its value for academic success?

Objective of the Study

- Conduct Systematic Literature Review on Teachers as Self Regulated Teachers using Vosviewer

- To Identify Key Research Areas and Recent Trends of Self-Regulation of Teachers

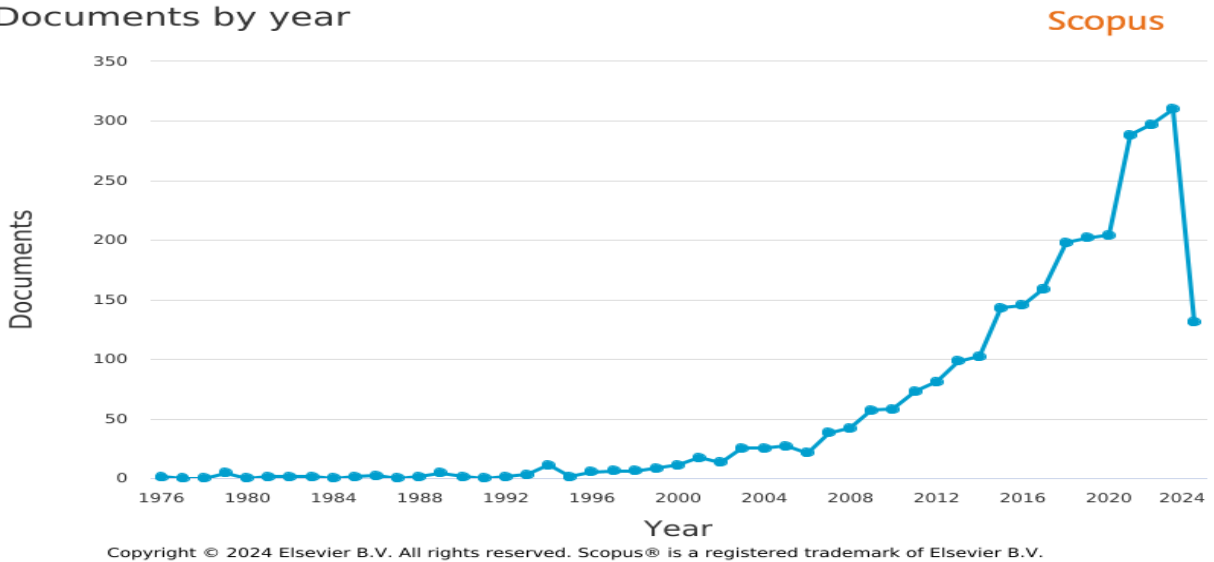
Researchers use the Vosviewer programme to analyse related studies that had been done in the past for the years 1976 to 2024 in order to understand the year-by-year publications, research articles, and book chapters in the subject of Teacher as self regulated learner. This has given researchers a thorough understanding of previous research done in the field.

Literature Review

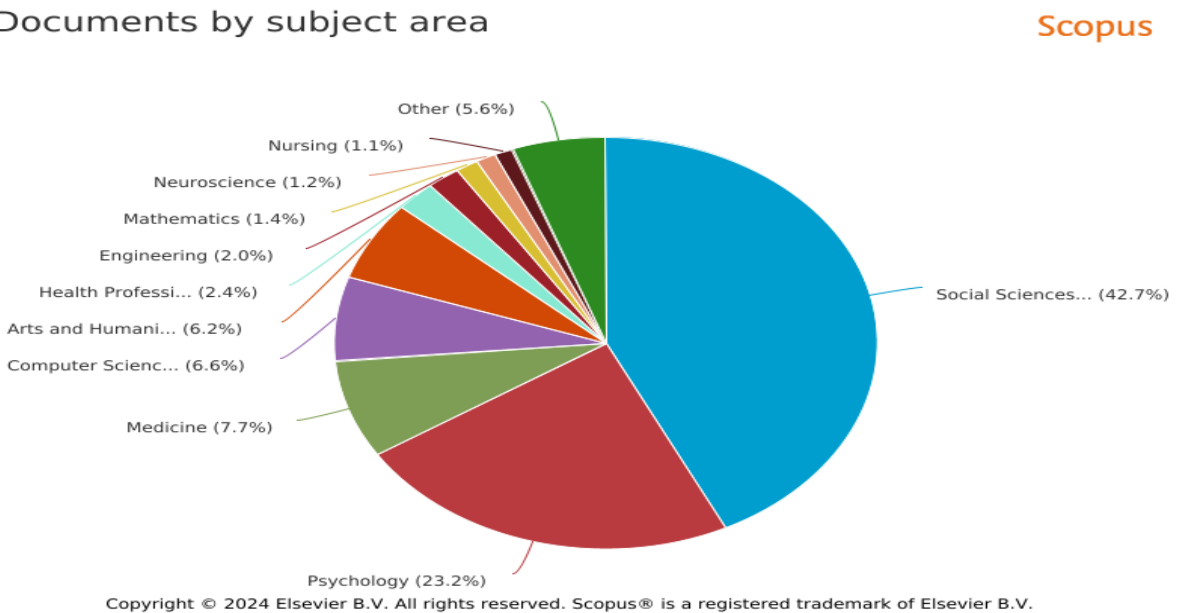
The researchers conducted an extensive literature review to explore the existing studies on teachers' self-

regulation. Using Vosviewer the researcher searched the scopus databases. The year wise research papers published only in Scopus publications are considered for the present study to maintain the quality of the research studies. The systematic review approach is adopted in this study. Our systematic review's objectives are to reorganise and compile the literature on teachers' self-regulation, spot emerging themes, and make further contributions in this area. The present study adopts the well acknowledged techniques and structure for performing a systematic literature review proposed by Khan et al. (2003).

Documents by year



Documents by subject area



Process followed to conduct the Literature Review:
 The keywords searched for are derived from earlier research on the subject of the study that was done and published in scopus papers. The authors developed a final list of keywords that may encompass all available research in the fields of self regulation of teachers by using terminology from these studies as a starting point. Table 1 lists the set of terms related to Self-regulation, teachers and education. All of the employed

search strings fall into the range of the important phrases.

Table 1 : Keywords Identified from previous studies

Keywords
Self-Regulation, Teachers
Self-Regulated Learning Environment, Teachers
Self-Regulated Teachers, Students' Academic Performance
Self-Regulated Students, Self-Regulated Teachers

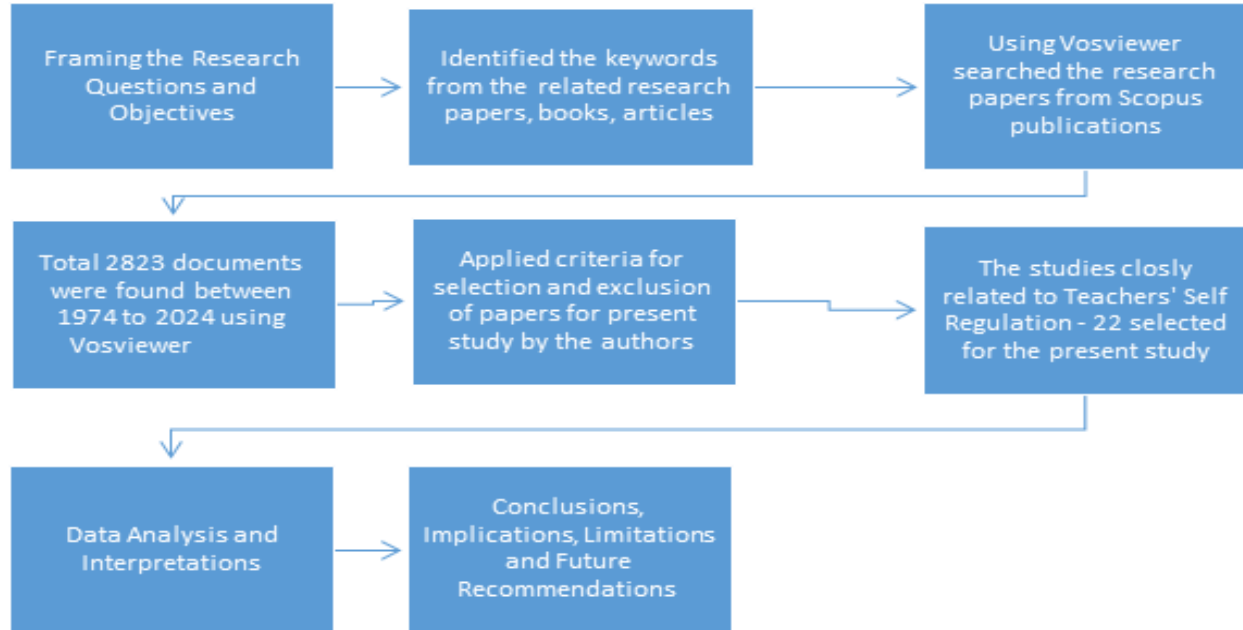


Fig. Process followed by the authors for the systematic literature review

Barr, S., and Askill-Williams, H. (2020). Examining teachers' epistemic cognition is crucial for understanding their teaching knowledge depth. While assessments typically focus on specific subjects like science or maths, it's equally important to enhance teachers' expertise in fostering students' self-regulated learning (SRL) across all subjects. Research reveals gaps in teachers' understanding of SRL, shaping their epistemic cognition. This study introduces a model and investigates four secondary science teachers in a 12-week Professional Learning Community (PLC). Analysis shows PLCs prompt teachers to reflect on their SRL knowledge and beliefs, leading to improvements in SRL content knowledge and pedagogical beliefs. Facilitated PLCs offer a bridge to translate research into classroom strategies.

Kallio, H., Kallio, M., Virta, K., Iiskala, T., and Hotulainen, R. (2020). Support from teachers

regarding learners' metacognitive awareness (MA) is vital for effective learning. While previous research has predominantly focused on students' MA, this study explores how subject teachers and special teachers (N = 1,045) perceive their role in supporting learners' MA in both general education and vocational education and training settings. The study reveals that special teachers tend to provide more systematic support for learners' MA compared to other teachers. Additionally, perceived support for learners' MA varies among different components of MA and across teacher groups. These findings underscore the importance of developing MA support skills through pre-service and in-service teacher education to facilitate lifelong learning processes among learners. Furthermore, the study sheds light on current approaches used by teachers to address this challenge.

Kramarski, B., and Kohen, Z. (2017). Recent research suggests that for teachers to effectively enhance their students' self-regulation, they must undertake dual roles in self-regulation. Firstly, they need to master self-regulated learning (SRL) themselves, and then they must explicitly learn how to teach SRL, termed self-regulating teaching (SRT). Given the challenge for novice teachers in attaining both roles, support is crucial. We examined an intervention comparing the effectiveness of two prompting conditions – generic versus specific – for developing SRL and SRT among 90 preservice science teachers. They engaged in explicit self-regulation instruction and reflective group discussions. The specific-prompt condition showed better outcomes in self-awareness of SRL, noticing students' SRL, and using SRT during teaching. Both conditions performed similarly on a novel lesson-design task. These findings, supported by case studies, contribute to understanding novice teachers' self-regulation prompting approaches and professional development.

Panadero, E. (2017). Self-regulated learning (SRL) encompasses various facets of learning, including cognitive, metacognitive, behavioural, motivational, and emotional aspects. As a result, it serves as a comprehensive framework for studying numerous variables influencing learning within educational psychology. This paper analyses and compares six prominent models of SRL: Zimmerman, Boekaerts, Winne and Hadwin, Pintrich, Efklides, and Hadwin, Järvelä, and Miller. Each model is examined in detail, covering its history, description, empirical support, and associated instruments. Comparative aspects include citations, phases, conceptualizations of cognition, motivation, and emotion, top-down/bottom-up approaches, automaticity, and context. The discussion delves into empirical evidence from existing SRL meta-analyses and extracts implications for education, proposing four future research directions. The review concludes that SRL models provide an integrated framework for research and teaching strategies, with differential effects across student developmental stages or educational levels. Hence, leveraging these differences can enhance students' learning and SRL skills.

Haimovitz, K., and Dweck, C. S. (2017). Children's beliefs about intelligence, whether it's something they can develop or a fixed trait, significantly impact their motivation and academic success. How can adults

encourage a "growth mindset" in children? While it may seem logical that adults would convey their own growth mindsets to children, recent research suggests that many parents and teachers with growth mindsets fail to do so. This article offers a fresh perspective on why this occurs and reviews research on effective adult practices for fostering growth mindsets. It emphasises the importance of maintaining a focus on the learning process. The article discusses key implications and potential future research directions before examining the topic within broader societal contexts, such as the implications for high-stakes testing.

Bembenutty, H., White, M. C., and Vélez, M. R. (2015). Over recent decades, self-regulated learning has become integral to education, including teacher training programs, as it fosters academic success. This book targets aspiring teachers, assuring them that they possess the capability to succeed, exemplified through the experiences of four teacher candidates. It also serves teacher educators, advocating for curriculum adaptations to incorporate self-regulation principles. Drawing on research, the authors emphasise the crucial role of self-regulated teacher educators in shaping candidates' abilities. Endorsements from experts highlight the book's practicality and inspiration for both teacher students and educators worldwide.

Ohst, A., Glogger, I., Nückles, M., and Renkl, A. (2015). Psychological research offers valuable insights for educators, including knowledge on effective learning strategies. However, teachers may possess incomplete or inaccurate intuitive knowledge, hindering their adoption of psychological insights. Effective interventions to address such fragmentary knowledge are limited, prompting the development of a categorical framework to aid preservice teachers in organising their prior knowledge. In this experiment, the framework group (n=23) received this framework as a pre training intervention, while the control group (n=22) received similar factual information without the categorical framework. Both groups then learned about cognitive and metacognitive learning strategies. Despite achieving comparable learning outcomes, the framework group required less time to learn (a strong effect) and expressed higher interest in the material (a medium effect). This study demonstrates that providing a categorical framework can enhance

preservice teachers' interest in learning materials and optimise learning efficiency.

Kistner, S., Rakoczy, K., Otto, B., Klieme, E., and Buttner, G. (2015). Teaching learning strategies is crucial for promoting self-regulated learning in classrooms. This study examined how instructional context and teacher beliefs influence teachers' promotion of learning strategies. Twenty mathematics teachers were observed during lessons on the Pythagorean Theorem (introductory unit) and word problems (practice unit). Results showed that cognitive strategies were emphasised more in introductory lessons, while planning strategies were more prevalent in practice lessons. Additionally, teachers with progressive beliefs were more likely to teach various strategy types, while those with traditional beliefs were less inclined to promote certain strategies. This underscores the importance of teacher beliefs in strategy instruction and suggests they could be a key focus for enhancing self-regulated learning promotion and teacher training.

Spruce, R., and Bol, L. (2015). This study explored ten elementary and middle school teachers' beliefs, knowledge, and classroom practices regarding self-regulated learning (SRL). Using Zimmerman's SRL model, researchers conducted questionnaires, classroom observations, and interviews. While teachers held positive beliefs about SRL, they had reservations about students' abilities at these grade levels. Interviews revealed gaps in teachers' knowledge, particularly in goal setting and evaluation. Teachers most frequently encouraged student SRL during the monitoring phase, but gaps emerged in planning and evaluation stages. Alignment between teachers' beliefs, knowledge, and practices varied, suggesting a need for ongoing professional development in SRL strategies.

Chatzistamatiou, M., Dermitzaki, I., and Bagiatis, V. (2014). This study aimed to explore the connections between teachers' utilisation of self-regulatory strategies in mathematics instruction and various individual motivational and affective factors. A total of 292 primary school teachers from Greece completed two questionnaires evaluating (a) their personal strategies for planning, monitoring, and evaluating mathematics instruction and (b) the methods employed to promote students' self-regulated learning in mathematics. Path analysis revealed that teachers' adoption of self-regulation strategies, both

for their own teaching and for fostering students' self-regulation in mathematics, were influenced by their beliefs in their teaching efficacy, the significance they ascribe to mathematics, and their emotional dedication to their profession. Interestingly, teachers' enjoyment of teaching mathematics did not directly correlate with their reported use of self-regulatory instructional strategies. The findings suggest implications for the design of teacher training programs focusing on self-regulated instruction.

De Backer, F., Reina, V. R., Kindekens, A., Buffel, T., and Lombaerts, K. (2014).

Teachers are essential in fostering self-regulated learning (SRL) among students. While primary school teachers generally support the incorporation of SRL in their classrooms, various factors hinder them from fully embracing and promoting SRL. Drawing from a comprehensive literature review, this paper highlights teachers' own self-regulatory competencies as a crucial factor influencing the implementation of SRL in primary schools. Teachers who are self-regulated themselves adapt their instructional methods to align with their SRL skills, gain a deeper understanding of SRL processes, and become more effective in promoting SRL among their students. The paper concludes by exploring the relationship between teachers' self-regulation and their ability to encourage SRL in students.

Peeters, J., De Backer, F., Reina, V. R., Kindekens, A., Buffel, T., and Lombaerts, K. (2014). Teachers are pivotal in fostering self-regulated learning (SRL) among students. While primary school teachers generally welcome the idea of incorporating SRL into their classrooms, various factors hinder them from fully embracing it. Drawing on an extensive literature review, this paper highlights teachers' own self-regulatory abilities as a key factor influencing the implementation of SRL in primary school settings. Teachers who are adept at self-regulation are more likely to tailor their instructional methods to their own SRL skills, comprehend SRL processes better, and effectively promote SRL among students. The paper concludes by exploring the interplay between teachers' self-regulation and the enhancement of students' SRL. Askell-Williams, H., Lawson, M. J., and Skrzypiec, G. (2012). Teachers' understanding of learning impacts student outcomes, just as students' awareness of their learning influences self-regulated learning and academic achievement. Despite research backing

these ideas, a gap exists between research and classroom practices. This paper addresses efforts to bridge this gap. In Study 1, we assessed early adolescent students' use of cognitive and metacognitive strategies, revealing room for improvement. In Studies 2 and 3, we collaborated with teachers to integrate explicit instruction on these strategies using learning protocols. Results showed seamless integration into lessons, aiding teachers in instruction delivery and enhancing some students' strategy knowledge, albeit with varied progress rates. Recommendations are provided for supporting teachers and students in adopting cognitive and metacognitive strategy instruction.

Moos, D. C., and Ringdal, A. (2012). Recent advancements in educational research have confirmed individual differences in students' learning processes. Methodological innovations now allow researchers to delve into how students learn, not just what they learn. Active engagement in learning, including setting meaningful goals and employing effective strategies, positively influences learning outcomes. This paper explores how teachers can support students' development of these processes, focusing on Self-Regulated Learning (SRL) theory. It discusses methodological advancements, theoretical frameworks, and studies on self-regulation among both preservice and inservice teachers. The paper concludes by examining the implications of the reviewed studies for theory, methodology, and practice in education.

Hamman, D., Berthelot, J., Saia, J., and Crowley, E. (2000). This study investigated how middle school teachers coach learning and its impact on students' strategic learning. Eleven teachers were observed during instruction, while 235 students completed a questionnaire on learning strategies. Coaching of learning occurred in only 9% of instruction segments, with teachers often recommending the use of learning aids and engagement in metacognitive activities. Results showed a significant relationship between teachers' coaching of learning and students' strategic learning activity, suggesting the importance of teacher guidance in promoting effective learning strategies.

Paris and Winograd (2003) This study focuses on "The Role of Self-Regulated Learning in Contextual Teaching: Principles and Practices for Teacher Preparation." It emphasises the importance of teachers being reflective and analytical about their beliefs and

practices, as well as having a deep understanding of cognitive and motivational principles in learning and teaching. The paper explores how teachers can model and promote self-regulated learning (SRL) for students, which involves awareness of one's thinking, strategic use of learning methods, and motivation within specific contexts. To instil these qualities in students, teachers must experience, construct, and discuss these aspects themselves. The paper reviews twelve principles of SRL, categorised into four groups, focusing on how teachers can analyse their learning styles, evaluate their understanding, and model cognitive monitoring. It also discusses strategies for promoting mastery goal orientations, managing time and resources, and using setbacks constructively, along with effective methods for teaching these concepts to students.

Muis, K. R. (2007). This article aims to propose an integrated theoretical model linking epistemic beliefs and self-regulated learning. Drawing on a review of theoretical frameworks, models, and empirical studies, it explores the role of epistemic beliefs in self-regulated learning. Four propositions are presented: (a) epistemic beliefs are integral to the cognitive and affective aspects of a task, (b) they influence students' goal-setting standards, (c) they translate into epistemological standards shaping metacognition, and (d) self-regulated learning contributes to the development of epistemic beliefs. The article seeks to establish a foundation for enhancing comprehension of epistemic beliefs and their impact on various aspects of self-regulated learning.

Randi, J. (2004). This article explores how pre-service teachers are provided with opportunities to develop self-regulation skills as they transition into the role of educators in their teacher education program. It delves into self-regulated learning within the context of teachers' classroom practices, distinguishing between the volitional work styles and study habits of students and the learning-oriented volitional strategies that teachers employ to enhance their learning through teaching experiences. Using practical examples drawn from a specific teacher education program, the article illustrates teachers' utilisation of strategies and highlights how volitional constructs manifest in practice. Furthermore, the article discusses potential approaches for teacher preparation programs to structure learning environments that facilitate the development of self-regulation skills among teachers,

enabling them to apply these strategies effectively in their teaching practice.

Peverly, S. T., Brobst, K. E., Graham, M., and Shaw, R. (2003). Self-regulation purportedly holds a significant role in memory and learning, particularly among adults. While research utilising simple materials suggests that adults demonstrate adept self-regulatory skills, findings from studies involving more challenging materials present a contrasting picture. In an effort to enhance college students' self-regulation, particularly when faced with difficult materials, the authors explored the effectiveness of providing extended study time before tests. Additionally, the study investigated whether factors such as background knowledge and note-taking strategies correlated positively with self-regulation. However, results indicated that college students exhibited deficiencies in self-regulation, with neither background knowledge nor note-taking showing significant associations with self-regulation. Interestingly, note-taking and background knowledge emerged as stronger predictors of test performance compared to self-regulation. These findings suggest that test performance may be more closely linked to note-taking and background knowledge rather than self-regulation.

Hofer, B. K., and Pintrich, P. R. (1997). Several research programs have explored students' thoughts and beliefs regarding the nature of knowledge and knowing, encompassing definitions, construction, and evaluation of knowledge. However, these programs have adopted diverse definitions, conceptual frameworks, and methodologies to investigate students' epistemological beliefs and thinking. The first section of this article critically reviews these research programs comprehensively. In the second part, we identify nine essential theoretical and methodological issues requiring resolution in future epistemological research. Addressing these issues will foster greater consensus on the nature of epistemological theories and elucidate their relationship with cognition, motivation, and learning.

Prawat, R. S. (1989). This paper focuses on access, defined as the capacity to utilise one's intellectual resources in relevant situations. Numerous factors impact access, identified across different research strands representing various construct and curriculum perspectives. However, few attempts have been made to integrate this research. This paper aims to fill this gap by employing a framework deemed relevant

across research domains. According to this framework, students' ability to access knowledge, strategies, and dispositions is influenced by two factors: organisational and reflective awareness. The paper explores how these factors affect access in different informational categories and suggests ways in which teachers can enhance these factors to promote access or transfer in students.

Flavell, J. H. (1979). Research indicates that young children have limited knowledge about cognitive processes, known as metacognition, and engage in minimal self-monitoring of their memory, comprehension, and other cognitive activities. Metacognitive knowledge encompasses one's beliefs about oneself and others as cognitive agents, tasks, actions or strategies, and their interactions impacting intellectual outcomes. Metacognitive experiences involve conscious cognitive or affective experiences during cognitive tasks, often related to their effectiveness. There is a need for further research to describe and understand spontaneous developmental advancements in this area and to identify effective methods for teaching metacognitive knowledge and cognitive monitoring skills.

CONCLUSION

In conclusion, the synthesis of the reviewed studies underscores the paramount importance of self-regulated learning (SRL) and metacognitive awareness (MA) in both student learning and teacher education. The findings collectively emphasise the critical need for teachers to possess a deep understanding of these concepts and to effectively integrate them into their teaching practices.

The studies highlight various approaches to support teachers in fostering SRL and MA among students. Professional Learning Communities, specific prompting techniques, and targeted teacher support are identified as effective strategies for enhancing teachers' proficiency in promoting these skills. Moreover, the importance of nurturing a growth mindset among both teachers and students is underscored as a key factor in fostering SRL and MA. Furthermore, the studies stress the significance of incorporating self-regulation principles into teacher training programs and providing teachers with the necessary tools and resources to integrate SRL and MA into their instructional practices effectively.

Overall, the synthesis of the reviewed studies provides valuable insights for educators, teacher educators, and policymakers aiming to enhance teaching and learning outcomes. By prioritising the development of SRL and MA skills in both teachers and students, education stakeholders can contribute to creating more engaging, effective, and student-centred learning environments.

LIMITATION OF STUDY

The present research review is subject to some limitations and does not intend to encompass all articles that address the concepts of teachers' self-regulation. The inclusion of papers from the Scopus database served as the foundation for this study. The fact that only research on teachers' self-regulation is taken into account is a further limitation. Research on teachers' self-regulation is possible, and multidisciplinary areas such as educational psychology, cognitive science, and instructional design may all be explored.

The future directions for research derived from results and conclusion, in this area can be on:

- Advocacy for SRL in Educational Reform
- Contextual conditions to foster self regulated learning in teacher education programme
- methodologies and analytic tools to study SRL which can provide deeper insights into teachers' competence and effective self regulated learning support

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